SESSION SUMMARY
ASSESSMENT OF REEF STOCKS

by

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Introduction

This session was devoted to methods of assessing reef stocks by means other than analysis of recreational and commercial catch-effort data.

Barans presented the overview paper in which he stressed the importance of planning to obtain a quantifiable end product and a greater understanding of the biology of the species. Particular consideration should be given to gear selectivity and sampling design. Complementary sampling gear should be used to obtain the best estimates of abundance. The paper by Gutherz discussed the assessment efforts of the Southeast Fisheries Center. He pointed out that reef fishing has increased considerably in the past several years, and that this has caused fishery management councils to place high priority on assessment of snapper-grouper stocks. The importance of sampling design and multigear surveys was again emphasized. The advantages and disadvantages of the various sampling techniques were discussed in both papers as well as the importance of gear mensuration.

In my paper I showed that still photography cannot be used for reef fish abundance counts because many fish fade into the background and cannot be counted. By comparing mark-recapture data to diver counts I also showed that too few fish are tagged and recaptured during large area (1/2 mile x 3 miles) reef fish studies for meaningful estimates by mark-recapture techniques. I further presented data showing that counts made from submersibles are as good as those made by divers. Thus, submersibles can be a useful tool when attempting to measure reef fish stocks over large areas and in deep water inaccessible to divers.

Discussion

Jack Damman said that Caribbean shallow water reef fish are being fished near maximum sustainable yield. There is an urgent need to explore and develop, if possible, deep water (100-300 fms) fisheries. Submersibles and side scan sonar may be the best methods of exploring these areas.

Churchill Grimes and Charles Barans emphasized the importance of visual techniques for stock assessment and a need to use a variety of complementary sampling gears.

John Ogden emphasized the large species diversity and complex systems on reefs and that all species are important in these systems and should be studied. Jack Damman suggested that applying methods for measuring terrestrial populations be looked at more closely. Gene Huntsman asked if extrapolation from quadrat counts would be better than line transects. Joe Powers and Saul Saila favored line transects and multiple gear sampling.

Gene Huntsman proposed the ultimate stock abundance sampling gear, REEFFAS, REEF Fish Assessment System. This system would consist of several color television cameras mounted in a frame that could be lowered from a vessel to the bottom and would photograph the entire hemisphere of visibility in which it sat. Multiple images could then be projected in a hemispherical viewing chamber aboard the vessel such that an observer inside the chamber would have essentially the same view as a diver sitting on the bottom. Such a device seems achievable with todays technology. Development of this instrument would combine the advantages of placing man in the sea with the low cost, deployability, and safety of remote techniques.

Suggested order of research

1. Explore deep water (100-300 fms) reef fisheries in the Caribbean. Shallow water reef fisheries are near maximum sustainable yield.

2. Develop new stock assessment sampling gear. Current gear is inadequate or too costly to do the job appropriately.

    A. 360° viewing system
    B. shadow graphing side scan sonar

3. Calibrate stock assessment sampling gear so that complementary sampling results can be compared.

4. Determine the amount of reef fish per-unit-area of habitat, and measure the amount of habitat. Then determine reef fish biomass by multiplying the two. Potential yield, independent from that obtained from catch-effort data, can then be calculated from the biomass estimate.